

**IN THE CLAIMS:**

Please amend the claims as follows:

1-11. (Canceled)

12. (Currently amended) A method, comprising extending a digital subscriber loop including:

producing an output signal in a first direction from a first variable gain amplifier at a mid-span extender unit responsive to an input signal in the first direction from said digital subscriber loop;

monitoring a signal strength of said output signal in the first direction at said mid-span extender unit;

generating a gain control signal responsive to said signal strength at said mid-span extender unit; and

controlling a first gain of said first variable gain amplifier at said mid-span extender unit responsive to said gain control signal;

controlling a second gain of a second variable gain amplifier at said mid-span extender unit responsive to said gain control signal to produce an output signal in a second direction from said second variable gain amplifier at said mid-span extender unit responsive to a second input signal in said second direction from said digital subscriber loop; and

detecting whether a downstream signal is present on said digital subscriber loop. The method of claim 11,

wherein controlling said gain of said first variable gain amplifier includes determining when to change said gain based on at least one elapsed time interval selected from the group

consisting of Tnormal, Tshutdown, Tsleep, and Tdead, where Tnormal is a duration that persists while i) said downstream signal is present, and said gain is between a lower threshold and an upper threshold, or ii) said downstream signal is present, an upstream power level is below a lower threshold, and said gain is at an upper limit, or iii) said downstream signal is present, said upstream power level is above an upper threshold, and said gain is at a lower limit, where Tshutdown is a maximum duration of link termination, where Tsleep is a subsequent duration, and where Tdead is a duration that persists with a same gain setting while said downstream signal is not present and a control signal is below a low threshold.

13. (Currently amended) A method, comprising extending a digital subscriber loop including:

producing an output signal in a first direction from a first variable gain amplifier at a mid-span extender unit responsive to an input signal in the first direction from said digital subscriber loop;

monitoring a signal strength of said output signal in the first direction at said mid-span extender unit;

generating a gain control signal responsive to said signal strength at said mid-span extender unit; and

controlling a first gain of said first variable gain amplifier at said mid-span extender unit responsive to said gain control signal;

controlling a second gain of a second variable gain amplifier at said mid-span extender unit responsive to said gain control signal to produce an output signal in a second direction from said second variable gain amplifier at said mid-span extender unit responsive to a second input signal in said second direction from said digital subscriber loop; and

detecting whether a downstream signal is present on said digital subscriber loop. The method of claim 11,

wherein controlling said gain of said first variable gain amplifier includes changing said gain within a range defined by an upper limit and a lower limit if said downstream signal is not present, said gain control signal is below a low threshold, and a time interval Tdead has elapsed, where Tdead is a duration that persists with a same gain setting while said downstream signal is not present and said control signal is below said low threshold.

14. (Currently amended) A method, comprising extending a digital subscriber loop including:

producing an output signal in a first direction from a first variable gain amplifier at a mid-span extender unit responsive to an input signal in the first direction from said digital subscriber loop;

monitoring a signal strength of said output signal in the first direction at said mid-span extender unit;

generating a gain control signal responsive to said signal strength at said mid-span extender unit; and

controlling a first gain of said first variable gain amplifier at said mid-span extender unit responsive to said gain control signal;

controlling a second gain of a second variable gain amplifier at said mid-span extender unit responsive to said gain control signal to produce an output signal in a second direction from said second variable gain amplifier at said mid-span extender unit responsive to a second input signal in said second direction from said digital subscriber loop; and

detecting whether a downstream signal is present on said digital subscriber loop. The method of claim 11,

wherein controlling said gain of said first variable gain amplifier includes increasing said gain if said downstream signal is present, said gain control signal is below a low threshold, and a time interval  $T_{up}$  has elapsed, where  $T_{up}$  is a duration persists while said downstream signal is present and said gain control signal is below said low threshold.

15. (Currently amended) A method, comprising extending a digital subscriber loop including:

producing an output signal in a first direction from a first variable gain amplifier at a mid-span extender unit responsive to an input signal in the first direction from said digital subscriber loop;

monitoring a signal strength of said output signal in the first direction at said mid-span extender unit;

generating a gain control signal responsive to said signal strength at said mid-span extender unit; and

controlling a first gain of said first variable gain amplifier at said mid-span extender unit responsive to said gain control signal;

controlling a second gain of a second variable gain amplifier at said mid-span extender unit responsive to said gain control signal to produce an output signal in a second direction from said second variable gain amplifier at said mid-span extender unit responsive to a second input signal in said second direction from said digital subscriber loop; and

detecting whether a downstream signal is present on said digital subscriber loop. ~~The method of claim 11,~~

wherein controlling said gain of said first variable gain amplifier includes decreasing said gain if said downstream signal is present, said gain control signal is above a high threshold, and

a time interval T<sub>down</sub> has elapsed, where T<sub>down</sub> is a duration that persists while said downstream signal is present and said gain control signal is above said high threshold.

16. (Currently amended) A method, comprising extending a digital subscriber loop including:

producing an output signal in a first direction from a first variable gain amplifier at a mid-span extender unit responsive to an input signal in the first direction from said digital subscriber loop;

monitoring a signal strength of said output signal in the first direction at said mid-span extender unit;

generating a gain control signal responsive to said signal strength at said mid-span extender unit; and

controlling a first gain of said first variable gain amplifier at said mid-span extender unit responsive to said gain control signal;

controlling a second gain of a second variable gain amplifier at said mid-span extender unit responsive to said gain control signal to produce an output signal in a second direction from said second variable gain amplifier at said mid-span extender unit responsive to a second input signal in said second direction from said digital subscriber loop; and

detecting whether a downstream signal is present on said digital subscriber loop. ~~The method of claim 11,~~

wherein controlling gain of said first variable gain amplifier includes forcing a link termination.

17-41. (Canceled)